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10/805,708

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EXAMINER

JEN, MINGJEN

ART UNIT

PAPER NUMBER

3664

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/805,708	Applicant(s) MORIDAIRA ET AL.	
	Examiner IAN JEN	Art Unit 3664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/02/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This action is in response to the amendment filed on September 5th, 2008.
2. Claims 1, 6, 11-13, 15 have been amended.
3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1, 6, 11 – 13, 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As for claims 1, 6, 11 – 13, 15, the phrase, “a timing of a potential risk” has not been described in the specification. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claim 1, 3, 6, 8, 11-13, 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamamoto (U.S. Pat NO. 6,330,494).

As to Claim 1, Yamamoto discloses a movable robot apparatus comprising: a safety level status detecting means (Column 1, lines 44 -55; See Central Control Unit 102, Column 4, lines 56 - 61) for detecting a safety level status; safety level detecting means (Column 1, lines 45-55; See External Editing Computer 400 in Column 5, lines 61-65) for detecting a safety level of safety level status detecting means; wherein the safety level of the detected safety level status is determined by comparing the detected safety level status to a plurality of threshold values (Fig 9, Column 7,lines 15 - 45; Column 7, lines 65 - Col 8,lines 20 where the threshold value is the tolerable range along with the average acceleration range) and grouping the detect safety level status as a function of the comparison result (Column 5,lines 10-25 where the sensor output are group of the status ; Column 7,lines 35 - 45; Column 8, lines 15 - 35 where the status is compared); control means (Column 1, lines 45-55; See Control Section 100 in Column 7, lines

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18-24) performing a control process so as to implement prescribed countermeasure according to safety level status by safety level status detecting means and safety level detected by safety level detecting means; wherein the safety level is a volume calculated as function of a joint angle (col 8, lines 20 – 65 where the angle range is the safety level volume), capability of a joint angle, a timing of a potential risk, and planned action (Col 7, lines 35 – Col 9, lines 20 where formula 14 examine tolerable angle range, capability of a joint angle; related to timing of a potential risk in acceleration from formula 1-9; and countermeasure calculated in formula 16-19; Fig 9, S18, col 8, lines 40 - 55, restore to normal posture as planned move); when the safety level increases and the countermeasures are performed (col 8, lines 20 – 65 the angle range is the safety level volume; col 8, lines 15 – 35, lines 45 -55), corresponding to a different safety level status(col 8, lines 15 – 35, lines 45 -55), the control means determines whether to maintain current countermeasures (col 8, lines 15 – 35, lines 45 -55).

As to Claim 3, Yamamoto discloses a movable robot apparatus according to claim 1, wherein: control means performs control process so as to implement countermeasures according to a position of said safety level status detected (Column 7, lines 18-25) by safety level status detecting means and safety level of the safety level status (Column 5, lines 61-65; Column 4, lines 57- 61).

As to claim 6, Yamamoto discloses a control method of a movable robot apparatus. The method comprises: a first step of detecting a safety level of safety level status detected (Abstract; Column 4, lines 40-50; Column 5, lines 61 - 65); determining the safety level of the

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detected safety level status by comparing the detected safety level status to a plurality of threshold values (Fig 9, Column 7, lines 15 - 45; Column 7, lines 65 - Col 8, lines 20 where the threshold value is the tolerable range along with the average acceleration range) and grouping the detected safety level status to a plurality of threshold values and grouping the detected safety level status as a function of the comparison result (Column 5, lines 10-25 where the sensor output are group of the status ; Column 7, lines 35 - 45; Column 8, lines 15 - 35 where the status is compared) and a second step of performing a control so as to make said robot apparatus implement prescribed countermeasures according to safety level status detected and safety level detected (Column 8, lines 18-31; Column 5, lines 61-65; Column 4, lines 48- 50); wherein the safety level is a volume calculated as function of a joint angle (col 8, lines 20 – 65 where the angle range is the safety level volume), capability of a joint angle, a timing of a potential risk, and planned action (Col 7, lines 35 – Col 9, lines 20 where formula 14 examine tolerable angle range, capability of a joint angle; related to timing of a potential risk in acceleration from formula 1-9; and countermeasure calculated in formula 16-19; Fig 9, S18, col 8, lines 40 - 55, restore to normal posture as planned move); when the safety level increases while the countermeasures are performed (col 8, lines 20 – 65 the angle range is the safety level volume; col 8, lines 15 – 35, lines 45 -55), corresponding to a different safety level status(col 8, lines 15 – 35, lines 45 -55), the control means determines whether to maintain current countermeasures (col 8, lines 15 – 35, lines 45 -55).

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As to claim 8, Yamamoto discloses the control method according to claim 6, wherein: , in second step, control process is performed so as to make robot apparatus implement countermeasures according to a position of safety level status detected and safety level detected(Column 7, lines 19- 25).

As to claim 11, Yamamoto discloses a movable robot comprising: safety level status detecting means for detecting a safety level status (Column 1, lines 44 -55; See Central Control Unit 102 in Abstract, Column 4, lines 56 – 61; Column 4, lines 40- 50) ; and control means for performing a control process so as to implement prescribed countermeasures according to a position of said safety level status detected by said safety level status detecting means (See Control Section 100 in Column 4 , lines 57 – 61; Column 7, lines 18 – 25; Column 9, lines 7 - 20); where in the position of the detected safety level status is determined by comparing the detected safety level status to a plurality of threshold values (Fig 9, Column 7,lines 15 - 45; Column 7, lines 65 - Col 8,lines 20 where the threshold value is the tolerable range along with the average acceleration range) and grouping the detected safety level status as a function of the comparison result (Column 5,lines 10-25 where the sensor output are group of the status ; Column 7,lines 35 - 45; Column 8, lines 15 - 35 where the status is compared); wherein the safety level is a volume calculated as function of a joint angle (col 8, lines 20 – 65 where the angle range is the safety level volume), capability of a joint angle, a timing of a potential risk, and planned action (Col 7, lines 35 – Col 9,lines 20 where formula 14 examine tolerable angle range, capability of a joint angle; related to timing of a potential risk in acceleration from formula 1-9; and countermeasure calculated in formula 16-19; Fig 9, S18, col 8,lines 40 - 55,

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restore to normal posture as planned move); when the safety level increases while the countermeasures are performed (col 8, lines 20 – 65 the angle range is the safety level volume; col 8, lines 15 – 35, lines 45 -55), corresponding to a different safety level status(col 8, lines 15 – 35, lines 45 -55), the control means determines whether to maintain current countermeasures (col 8, lines 15 – 35, lines 45 -55).

As to claim 12, Yamamoto discloses a control method of a movable robot apparatus, comprising: a first step of detecting a safety level status (Column 10, lines 8 - 45); determining the position of the detected safety level status by comparing the detected safety level status to a plurality of threshold values (Fig 9, Column 7,lines 15 - 45; Column 7, lines 65 - Col 8,lines 20 where the threshold value is the tolerable range along with the average acceleration range) and grouping the detected safety level status as a function of the comparison result (Column 5,lines 10-25 where the sensor output are group of the status ; Column 7,lines 35 - 45; Column 8, lines 15 - 35 where the status is compared); and a second step of performing a control process so as to make robot apparatus implement prescribed countermeasures according to a position of safety level status detected in first step (Column 7, lines 18 - 25); wherein the safety level is a volume calculated as function of a joint angle (col 8, lines 20 – 65 where the angle range is the safety level volume), capability of a joint angle, a timing of a potential risk, and planned action (Col 7, lines 35 – Col 9,lines 20 where formula 14 examine tolerable angle range, capability of a joint angle; related to timing of a potential risk in acceleration from formula 1-9; and countermeasure calculated in formula 16-19; Fig 9, S18, col 8,lines 40 - 55, restore to normal posture as planned move); determining whether to maintain current countermeasures when the safety level

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increases and the countermeasures are performed (col 8, lines 15 – 35, lines 45 -55), corresponding to a different safety level status (col 8, lines 20 – 65 the angle range is the safety level volume; col 8, lines 15 – 35, lines 45 -55; col 8, lines 15 – 35, lines 45 -55).

As to claim 13, Yamamoto discloses a robot apparatus having a plurality of movable units, comprising: a driving means for driving said movable units (See servo motor in Column 3, lines 40 – Column 4, lines 38); control means for controlling said driving units (See Control Section 100 in Column 4, lines 57 – 61); object detecting means for detecting an object(See CCD Camera in Column 4, lines 40- 48); action determination means for determining an action of robot apparatus (See External Editing Commander Computer 400 in Column 7, lines 4-16); and safety level detecting means for detecting safety level involving object and movable units(See CPU 102 in Column 5, lines 11- 26); wherein control means moves movable units as a function of safety level and action determined by action determination unit to mitigate or avoid danger (See External Editing Computer 400, CPU 102, Control Section 100 in Abstract; Column 7, lines 4 - 25; Column 8 ,lines 40 - Col 9, lines 5 where the control section move the movable unit with respect to the angle function defined as safety level), wherein the action determined is preprogrammed countermeasure corresponding to the detected safety level (Column 8, lines 40 - Column 9, lines 20, control section 00; where the action corresponding to angle and acceleration value of the robot respectively to the preprogrammed countermeasure in control section 100); wherein the safety level is a volume calculated as function of a joint angle (col 8, lines 20 – 65 where the angle range is the safety level volume), capability of a joint angle, a timing of a potential risk, and planned action (Col 7, lines 35 – Col 9,lines 20 where formula 14 examine

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tolerable angle range, capability of a joint angle; related to timing of a potential risk in acceleration from formula 1-9; and countermeasure calculated in formula 16-19; Fig 9, S18, col 8, lines 40 - 55, restore to normal posture as planned move); when the safety level increases and the countermeasures are performed (col 8, lines 20 – 65 the angle range is the safety level volume; col 8, lines 15 – 35, lines 45 -55), corresponding to a different safety level status(col 8, lines 15 – 35, lines 45 -55), the action determination means determines whether to keep current countermeasures (col 8, lines 15 – 35, lines 45 -55).

As for claim 15, Yamamoto discloses a control method of a robot apparatus having a plurality of movable units, control method comprising: a first step of determining an action of robot (Column 5, lines 11-25), a second step of, when an object is detected, detecting safety level involving the object and movable units(Column 4 ,lines 40-50; Column 5, lines 18-26); and a third step of moving movable units based on safety level detected and action determined to mitigate or avoid danger (Abstract; Column 7, lines 18-25); wherein the action determined is preprogrammed countermeasure corresponding to the detected safety level (Column 8, lines 40 - Column 9, lines 20, control section 00; where the action corresponding to angle and acceleration value of the robot respectively to the preprogrammed countermeasure in control section 100); wherein the safety level is a volume calculated as function of a joint angle (col 8, lines 20 – 65 where the angle range is the safety level volume), capability of a joint angle, a timing of a potential risk, and planned action (Col 7, lines 35 – Col 9, lines 20 where formula 14 examine tolerable angle range, capability of a joint angle; related to timing of a potential risk in acceleration from formula 1-9; and countermeasure calculated in formula 16-19; Fig 9, S18, col

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8, lines 40 - 55, restore to normal posture as planned move); determining whether to keep the action when the safety level increases and the action is being performed (col 8, lines 20 – 65 the angle range is the safety level volume; col 8, lines 15 – 35, lines 45 -55), corresponding to a different action (col 9, lines 5 - 20).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 2, 7, 14, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (US Patent No. 6,330,494) in view of Furuta et al. (US Patent No. 6,902,015).

As for claim 2, Yamamoto show all the elements of the claim 1 except safe space is defined so as to correspond to each safety level status to be detected safety level status detecting means and safety level detecting means detects safety level of safety level status based on a volume of the safe space corresponding to the safety level status detected safety level status detecting means. Furuta et al shows a safe space (See Anteflex Region in Claim 1; Fig 4; Fig 5; Column 7, lines 5-17). It would have been obvious to one of ordinary skill in the art to modify the robot apparatus of Yamamoto by setting the safe space for the robot of Furuta et al in order to provide a joint axis range determination in angular degree.

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As for claim 7, Yamamoto show all the elements of the claim 6 except the safe space is defined so as to correspond to each safety level status, and in first step, the safety level is detected based on a volume of the safe space corresponding to the safety level status. Furuta et al shows a safe space (Claim 1; Fig. 4; Fig 5; Column 7, lines 5-17). It would have been obvious to one of ordinary skill in the art to modify the robot apparatus of Yamamoto by setting the safe space of Furuta et al in order to provide a joint axis range determination in angular degree.

As for claim 14, Yamamoto shows all the elements of the claim 13. Yamamoto does not show safe spaces designated around movable units. Furuta et al shows safe spaces around movable units (Claim 1; Fig 4; Fig 5; Column 7, lines 5 - 17). It would have been obvious to one of ordinary skill in the art to modify the robot apparatus of Yamamoto by setting the safe space of Furuta et al in order to provide a joint axis range determination mean in angular degree.

As for claim 16, Yamamoto shows all the elements of the claim 15 and the control method in the second step. Yamamoto does not show safe spaces designated around movable units. Furuta et al shows safe spaces around movable units (Claim 1; Fig. 4; Fig 5; Column 7, lines 5-17). It would have been obvious to one of ordinary skill in the art to modify the robot apparatus of Yamamoto by setting the safe space of Furuta et al in order to provide a joint axis range determination mean in angular degree.

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- 8.** Claim 4, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (US Patent No. 6,330,494) in view of Hattori et al. (US Patent No. 6,463,356).

As for claim 4, Yamamoto shows all the elements in claim 3 except a control means performs control process so as to implement different countermeasures depending on whether position of safety level status is in an upper body or a lower body of robot apparatus. Hattori et al shows the control means performs control process so as to implement different countermeasures (See upper limbs, lower limbs in Column 20, lines 22 – 38; Column 21, lines 17-24) depending on whether position of said safety level status is in an upper body or a lower body of robot apparatus. It would have been obvious to one of ordinary skill in the art to modify the robot apparatus of Yamamoto by setting the control means of Hattori et al in order to perform control process with respect to torso connecting components harmoniously in individual countermeasurement.

As for claim 9, Yamamoto shows all the elements in claim 9 except the control method in second step, control process is performed so as to make robot apparatus implement different countermeasures (Column 20, lines 22 – 38; Column 21, lines 17-24) depending on whether position of safety level status is in an upper body or a lower body of robot apparatus. It would have been obvious to one of ordinary skill in the art to modify the robot apparatus of Yamamoto by setting the control means of Hattori et al in order to perform control process with respect to torso connecting components harmoniously in individual countermeasurement.

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9. Claim 5, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (US Patent No. 6,567,724) in view of Takahashi et al (U.S. Pat NO. 5,349,277).

As for claim 5, Yamamoto shows all the elements of the claim 1 except a robot apparatus according to claim 1, wherein: a priority previously set according to a position of safety level status and/or safety level of the safety level status; and control means, when safety level status detecting means detects a safety level status with a higher priority while control process to implement countermeasure is performed changes the control process so as to implement countermeasures against the safety level status newly detected. Takahashi et al shows priority is previously set according to a position of safety level status and/or safety level of the safety level status (See “ priority is established among the joints” in Column 8, lines 42- 61); and control means, when safety level status detecting means detects a safety level status with higher priority while control process to implement countermeasure is performed, changes the control process so as to implement counter measurements against the safety level status newly detected (Column 8, lines 42- 61). It would have been obvious to one of ordinary skill in the art to modify the robot apparatus of Yamamoto by setting the safety level status priority and safety level status priority control means of Takahashi et al in order to provide movable unit movable priority synchronized along with other movable units and control means.

As to claim 10, Yamamoto shows all the elements of the claim 6 except a control method, wherein: a priority is previously set according to a position of safety level status and/or safety level of safety level status; and in second step, when a safety level status with a higher priority is

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newly detected while control process to make robot apparatus implement countermeasures is performed, the control process is changed so as to make the robot apparatus implement countermeasures against the safety level status newly detected. Takahashi et al teaches a priority is previously set according to a position of safety level status and /or safety level of safety level status (Column 8, lines 42- 61) ; and in second step, when a safety level status with a higher priority is newly detected while control process to make robot apparatus implement countermeasure is performed , the control process is changed so as to make the robot apparatus implement countermeasures against the safety level status newly detected(Column 8, lines 42- 61). It would have been obvious to one of ordinary skill in the art to modify the robot apparatus of Yamamoto by setting the safety level status priority and safety level status priority control means of Takahashi et al in order to provide the movable unit movable priority synchronized along with other movable units and control means.

Response to Arguments

10. Applicant's remark entered on March 9th, 2009 has been fully considered and reviewed but is not particularly persuasive. Applicant's newly amended claim has been addressed in the claim rejection above.

11. In response to applicant's remark that Yamamoto (U.S. Pat NO. 6,330,494) does not show a volume calculated as a function of a joint, a capability of joint angle, timing of a potential risk and a planned action. Applicant's attention is directed to Yamamoto, where the volume calculated as a function of a joint is the volume of the angle used as an function of a joint in Yamamoto; a capability of joint angle is the angle tolerable range specified in Yamamoto; timing

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of a potential risk is the acceleration information along with the updated time tag used for failure calculation in Yamamoto; a planned action is the postures information stored in memory using route planning data. Further, applicant's attention is directed to applicant's remark entered on March 9th 2009, where the previous 112 rejection provided on December 11th 2008 have not been addressed and fully responded by applicant.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian Jen whose telephone number is 571-270-3274. The examiner can normally be reached on Monday - Friday 8:00-5:00 (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Khoi Tran can be reached on 571-272-6916. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Ian Jen/

Examiner, Art Unit 3664

/KHOI TRAN/

Supervisory Patent Examiner, Art Unit 3664